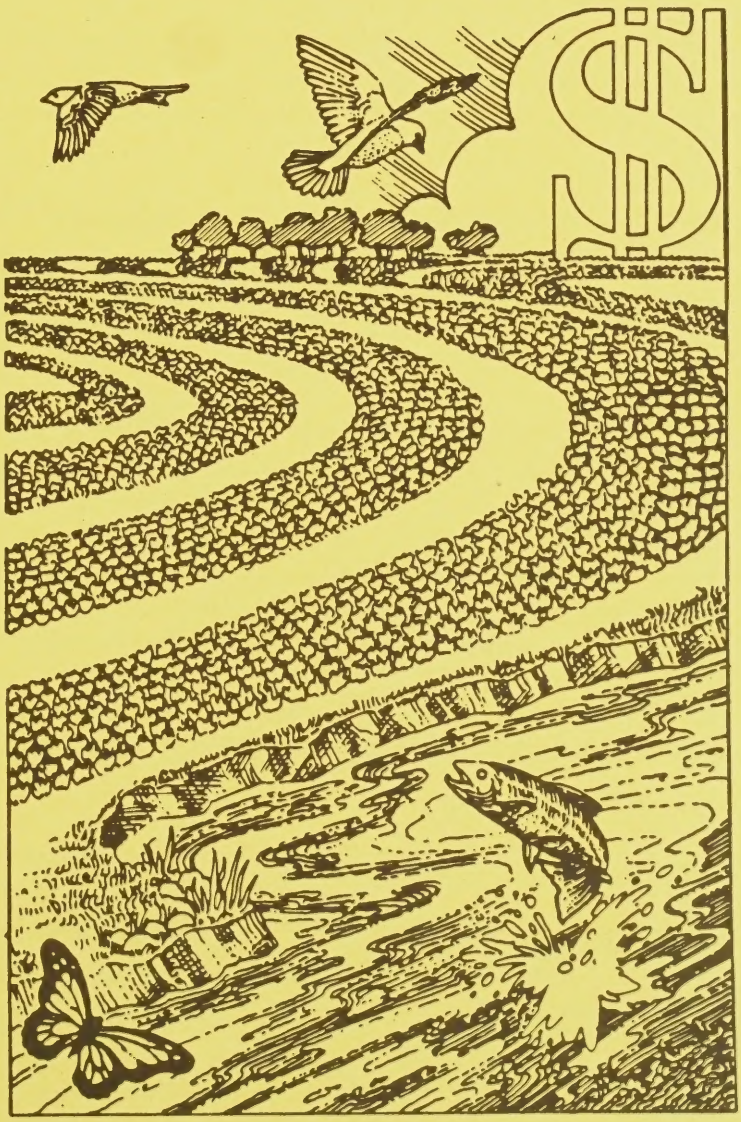
INDIANA

North-Central Region Projects Supported by Sustainable Agriculture Research and Education Program



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from project reports

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Overview of Indiana Projects

Congress has provided strong and growing support for the Sustainable Agriculture Research and Education grants program, also known as LISA (Low-Input Sustainable Agriculture). Administered by Cooperative State Research Service (CSRS), with the Cooperative Extension Service as a full partner, this program is forging partnerships between farmers, scientists, educators, agribusiness, non-profit organizations, and government -- a partnership that is beginning to promote better stewardship of the Nation's natural resource base. The program has supported 112 new projects since its inception in 1988; perhaps two dozen more will be funded by June.

Projects funded are typically carried out by teams of farmers, university research and education staff, government agencies, non-profit organizations, and private enterprise. Top priority is given to whole-farm integrated systems projects, usually including on-farm research and demonstrations. These projects are providing scientific documentation of low-input sustainable farming practices and systems, in comparison with conventional or chemical-intensive agriculture.

Farmer involvement is one of the strengths of this program. There has been active involvement in the administration of the North Central Region LISA program since its inception. Five producers from the region have served on the Administrative Council which develops policy and distributes funds. Six producers have also served on the Technical Committee which evaluated and recommends project proposals for funding.

Nationwide, 1,860 farmers have participated in projects during the first three years. When farmers participate in the planning and execution of a project, two important things happen. Concerns of farmers are foremost in the design of the project. And scientists get directly exposed to innovative ideas developed or tired by farmers. These ideas often become an integral part of scientific studies. The result is both better science and a more widespread adoption of more sustainable farming methods that are economically viable, socially acceptable, and environmentally sound, assuring cleaner water and a plentiful supply of safe food for generations to come.

The coordinators of Indiana projects were asked about participating farmers. Here is what they reported:

- A total of 21 Indiana farmers have participated in LISA research and education projects;

- 20 are reported to have helped generate ideas for these projects, and are helping with the evaluation of projects.

Projects Funded 1988-1990

Three projects funded by this program that include Indiana scientists, farmers, or educators in major roles are described here. These projects received a total of $155,621, and provided $195,993 matching funds. In most of the projects, a scientist serves as the Project Coordinator. In others, a farmer or other local area residents are contributing to a multi-state project headquartered in another state.

Low-Input Ridge Tillage System for the Corn Belt (LNC88-3)

Summary

Where ridge tillage is successful, crop yields are maintained or increased. Corn and soybean yields are usually maintained and often increase, especially on poorly drained or compacted soils. Production costs (notably herbicide and tillage costs) are reduced; less use is made of tractors and machinery, thus lowering costs for repairs, maintenance and fuel; and less labor is required. Because herbicide rates and costs are reduced by two-thirds, environmental impacts are reduced. Crop residues between the ridges minimize erosion and movement of chemicals into waterways. Agronomic research and economic analysis shows that ridge tillage is profitable on at least half of the corn/soybean land in the region. The purpose of this project was to determine more explicitly those conditions where ridge tillage can provide an economic and environmental improvement over conventional tillage practices.

Ridges were formed on a total of 165 acres of corn (1988-1989) at the Ohio Farm Science Review site. Two Ohio State University research farms where ridge tillage has been a part of experiments for 6 years, and several farmers with up to 24 years experience with ridge till have become part of the research, coordinated by Randall Reeder at Ohio State University.

- An experiment involving a western Ohio farmer (1988) using three passes with a rotary hoe instead of herbicides banded over the row resulted in yields being the same for both corn and soybeans. Weed control cost was reduced by two-thirds.

- Ridge till farmers in Ohio, Indiana and Illinois experienced cost reductions averaging $23.50 per acre for corn and $19.92 per acre for soybeans. There were no reports of yield decrease.

- Yields for 5 years of ridge till (1984-1988) in a corn/soybean rotation in Ohio were compared to yields for the previous 3 years of continuous corn in intensive tillage on the same plots. Corn yields doubled.

- In southwestern Iowa, surface runoff was reduced 53% and soil erosion was reduced 87% by adoption of ridge tillage.

- Ridge till farmers have also reduced their use of fertilizer without affecting yield or soil test measurements. They also reported increases in earthworm populations.

- Economic analysis done by Purdue University scientists indicated that ridge till offers the highest returns on most soils. Compared with fall-plowing, ridge tillage increased profits by $9 to $27 per acre in a corn-soybean rotation, and by $9 to $29 in continuous corn. No-till is most profitable on sloping, highly erodible soils.

Project Coordinator:	Randall Reeder, **Ohio State University**
Major Participants:	**Ohio State University**: D. Ecker, C. Fendrick, L. Whiting, A. Lines, C. Edwards, B. Stinner, N. Creamer, R. Holmes, E. Ozkan; **USDA Agricultural Research Service**: N. Fausey; **Purdue University**: D. Moore, S. Parsons, D. Griffith
Farmers:	**Ohio:** D. McNelly; **Illinois:** D. Klor; **Indiana:** J. Alexander, C. Eppley
Project Duration:	2 Years
Total Funding:	LISA Funds: $24,300; Matching Funds: $70,899

Sustainable Production Systems for Vegetables (LNC90-29)

Summary

Vegetable production is energy-intensive and environmentally threatening, requiring large inputs of water and agricultural chemicals. In order to maintain sustainability of small to moderate sized farms, alternative production systems must be developed. These systems must be environmentally and economically viable. The research outlined in this project is designed to allow the development of an alternative system for fresh market production of snapbeans, cabbage and tomatoes. This system will be based on utilization of an interseeding of hairy vetch and rye as a fall cover to protect the soil, provide nitrogen to the crops and allow reduced pesticide use as a result of allelopathic properties of the rye. The experiment will use a three-year rotation of cabbage, snapbeans, and tomatoes in association with the cover crops. The cover crops will be managed using two methods. The first will involve spring cultivation of the hairy vetch and rye into the soil, resulting in improved soil tilth and providing nitrogen to the crop. A second method will leave the cover crops on the soil surface to maximize the allelopathic potential of the rye for weed control and to provide a reduced tillage approach that will minimize soil erosion. Information from these field studies and surveys of small to moderate sized conventional and sustainable vegetable growers will be used to compare the potential risks, costs and economic returns of alternative and conventional production systems.

Information obtained in these studies will be disseminated to interested parties using extension publications, newsletter, on-farm demonstrations, field-days and grower meetings. These approaches will result in an efficient method of providing important information to vegetable growers (both organic and conventional) and to the public regarding alternative approaches to sustainable vegetable production. The overall goal of the project is development of economically competitive sustainable vegetable production systems that conserve natural resources and are environmentally sound.

Project Coordinator: Stephen C. Weller, **Purdue University**

Major Participants: **Purdue University:** G. Sullivan, B. Whipker; **University of Illinois:** J. B. Masiunas and W. Shoemaker

Farmers: **Illinois:** D. Hinkle; **Indiana:** D. Rietveld

Project Duration: 2 Years

Total Funding: LISA Funds: $78,321; Matching Funds: $75,094

Crop Rotation, Legume InterCropping and CulturaL Pest Control as Substitutes for Purchased Inputs in a Cash Grain Cropping System (LNC89-24)

Summary

Little data is currently available in the literature which compares both the agronomic and economic advantages of cash grain cropping systems which utilize varying levels of purchased chemicals and fertilizers. This study will compare four alternative cropping systems, at varying levels of purchased inputs. Comparisons made will focus on productivity of the systems using traditional yield measurements, profitability of the systems in both short and long-term economic terms, and the effects of these systems on the long-term productivity of the soil. Cropping systems used will include continuous corn, a corn/soybean rotation, a corn/soybean/wheat rotation, and a corn/oats/canola rotation. Within each rotation four levels of purchased chemical and fertilizer inputs will be used. Level one will involve no purchased inputs and will rely totally on cultural weed and pest control. Level two will attempt to produce 90% of the yields of the more input-intensive systems with less than 50% of the purchased fertilizers and chemicals. Where appropriate, legume intercrops will be included in both levels one and two. Level three will use "normal" input usage as recommended by the Indiana Cooperative Extension Service, and level four will use input levels commonly recommended by the more aggressive dealers in the state. An additional component of the three year rotations will be how the time after harvest of wheat or canola will be utilized. In put levels one and two, this time will be utilized for legume production. However, in input levels three and four, a cash crop such as soybeans or sorghum will be grown.

Objectives

1. Determine the effect of crop rotation, at different levels of purchased chemical and fertilizer input, on the productivity and profitability of the cropping system.

2. Determine the effects of crop rotation, legume intercropping and varying levels of purchased fertilizer inputs on the fertility and productivity and physical properties over time.

3. Determine the influence of crop rotation and varying levels of chemical and mechanical weed control on weed populations and species shifts over time.

Project Coordinator:	David B. Mengel, Soil Fertility, Crop Production, **Purdue University**, Dept. of Agronomy, West Lafayette, IN 47907.
Major Participant:	James J. Vorst, Crop Physiology; Michael Pitzer, Crop Production.
Project Duration:	2 Years
Total Funding:	LISA Funds: $53,000; Matching Funds: $50,000